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Br I

الجامعة اللبنانية
كلية الاعلام
الفرع الاول

امتحان الفصل الأول -النهائي
للعام الجامعي 2026/2025

المرحلة: الإجازة	الإختصاص: علم البينات	المادة: Database-1
السنة المنهجية:الاولى	المدة: ساعتين	عدد المسائل : 7 / عدد الصفحات:4
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Question 1 (2 pts) : Correspondance between ER and rational model. Complete by:

- 1:1 relationship
- ~~relationship relation and two foreign keys~~
- ~~Attribute~~
- Relation
- table and foreign key
- ~~set of simple component attributes~~
- primary key and value set

Q	ER model	Relational model
1.	Entity	
2.		Joining relation or foreign key
3.	M:N relationship	
4.	~~Simple attribute~~	
5.	Composite attribute	
6.	Multivalued attribute	
7.		Domain
8.	Key attribute and/or candidate key	

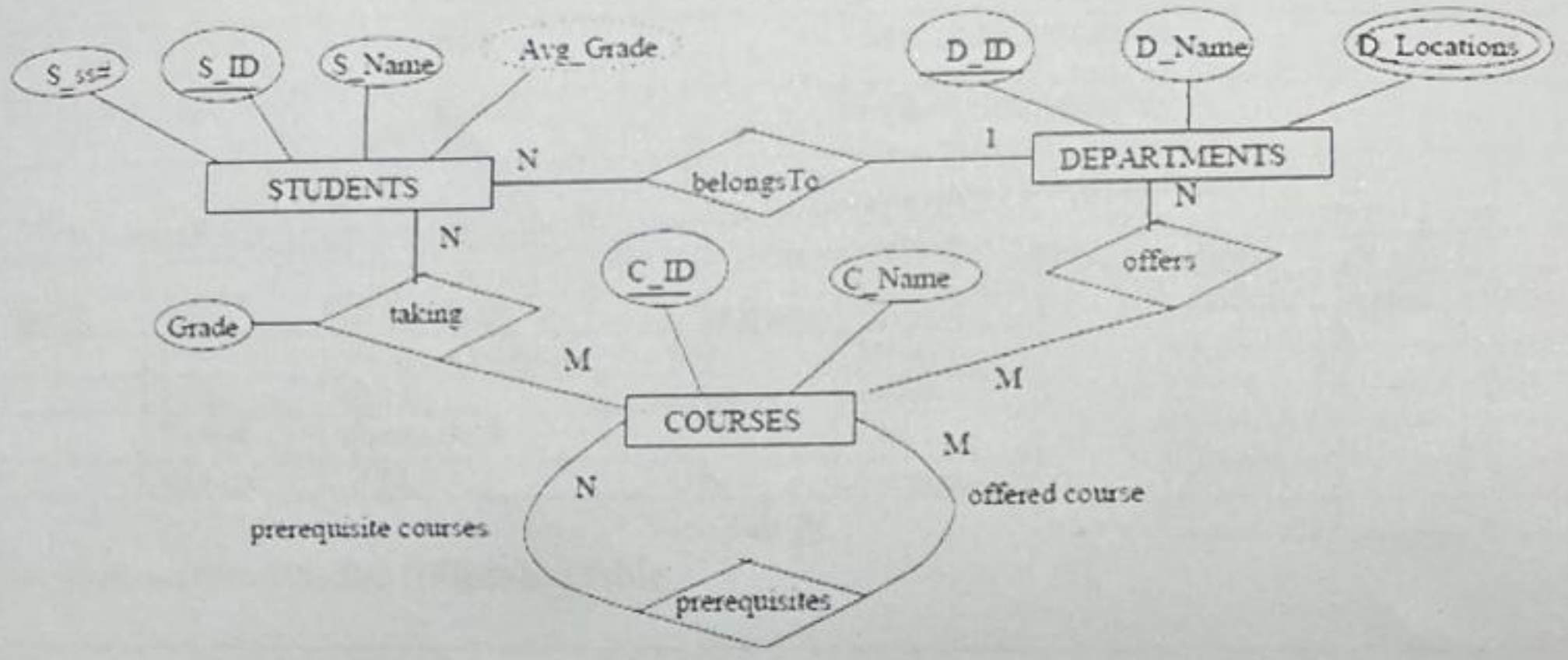
Question 2 (3 pts) : Design ER Diagram

Assume we have the following application that models soccer teams, the games they play, and the players in each team. In the design, we want to capture the following:

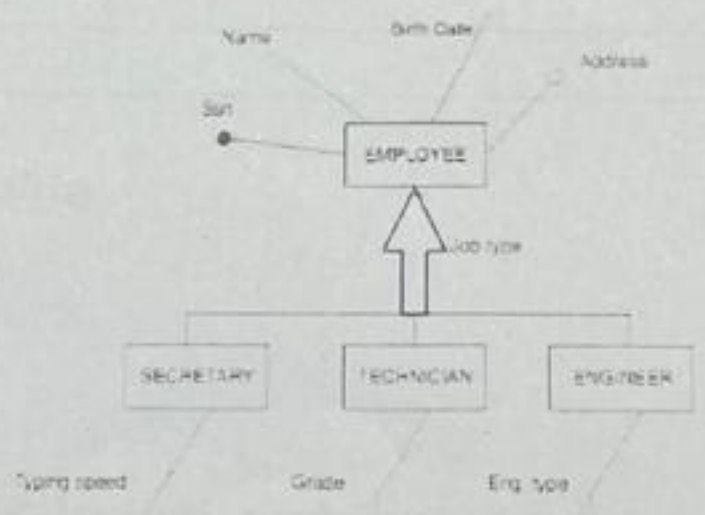
- We have a set of teams, each team has an ID (unique identifier), name, main stadium, and to which city this team belongs.
- Each team has many players, and each player belongs to one team. Each player has a number (unique identifier), name, DoB, start year, and shirt number that he uses.
- Teams play matches, in each match there is a host team and a guest team. The match takes place in the stadium of the host team.
- For each match we need to keep track of the following:
  - o The date on which the game is played
  - o The final result of the match
  - o The players participated in the match. For each player, how many goals he scored, whether or not he took yellow card, and whether or not he took red card.
  - o During the match, one player may substitute another player. We want to capture this substitution and the time at which it took place.
- Each match has exactly three referees. For each referee we have an ID (unique identifier), name, DoB, years of experience. One referee is the main referee and the other two are assistant referee.

Design an ER diagram to capture the above requirements. State any assumptions you have that affects your design (use the back of the page if needed). Make sure cardinalities and primarykeys are clear.

Question 3 (3 pts) : Mapping the ER diagram into logical schema (relational model)
Give a relational schema diagram for the following ER diagram



Question 4 (2 pts) : Mapping the EER diagram into logical schema (relational model)
Give a relational schema diagram for the following EER diagram



Question 5 (2 pts) :
The following relational tables are given (primary keys are underlined, optional attributes are indicated with "*"):
USER (UserID, Name, Surname, Email)
VIDEO (VideoID, Title, Description*, Duration, Category)
RATING (VideoID, UserID, Rating)
Use:

- The UserID attribute in the RATING table refers to the UserID attribute in the USER table
- The VideoID attribute in the RATING table refers to the VideoID attribute in the VIDEO table.
- The Rating attribute in the RATING table assumes integer values between 0 and 5.
- The Duration attribute of the VIDEO table takes only positive integer values.

Check if the following instances of the USER, VIDEO, and RATING tables are consistent with the above table schemas. **Justify your answer.**

user			
userID	Name	Surname	email
1	Laya	Majdalani	Lava40@gmail.com
2	Yola	Kassem	Yola2026@gmail.com
3	Omar	Yehia	Omar_yehia@gmail.com
4	Rida	Shadad	Rida_fawda@gmail.com

Video				
videoID	Title	Description*	Duration	Category
1	Foo	Goofy on vacation	50	fantasy
3	NULL	NULL	100	Yellow
5	Donald	Donald Duck	238	Comic
9	Memory	NULL	-10	Romantic

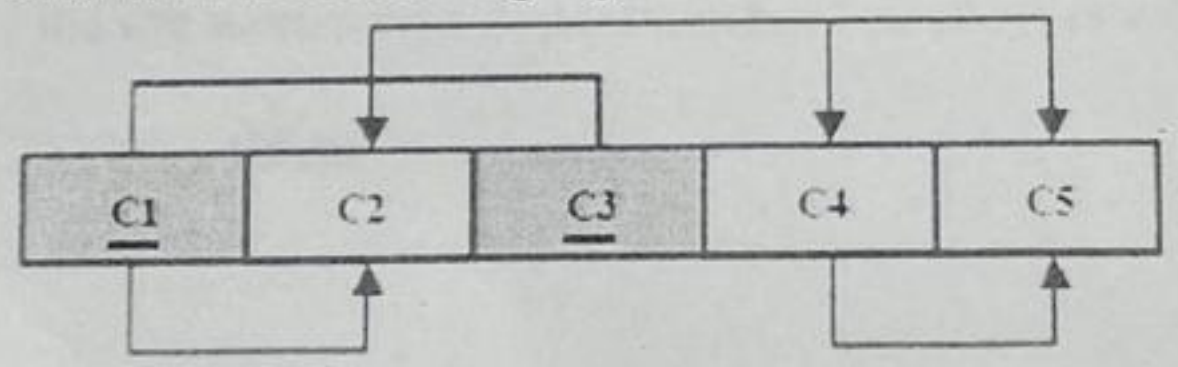
Rating		
VideoID	UserID	Rating
1	1	4
1	2	8
5	1	3
7	1	5
5	3	2
1	1	3

Give your answers as the following table :

Relation	Column(s)	Justify

Question 6 (4 pts) : Normalization

1. What is normalization?
2. When is a table in 1NF?
3. When is a table in 2NF?
4. When is a table in 3NF?
5. Identify and discuss each of the indicated dependencies in the dependency diagram shown in the following figure.



6. Fill in the blanks:

a. _____ produces a lower normal form.
b. Any attribute whose value determines other values within a row is called a(n) _____.
c. An attribute that cannot be further divided is said to display _____.
d. A relational table must not contain _____ groups.

Question 7 (4 pts) : SQL

Let the Employee table according to the schema:

Employee(Emp_ID (Employee ID), Emp_Name (Employee Name),DoB (Date of Birth),Department, Designation, DoJ (Date of Joining), Salary)

Employee

Emp_ID	Emp_Name	DoB	Department	Designation	DoJ	Salary
F110	Rami	15-JUN-1970	Director	Professor	12-APR-2001	45000
F111	Amal	25-MAY-1980	Data	Asst. Prof.	02-MAY-2006	30000
F115	Ghada	10-AUG-1982	CSE	Asst. Prof.	05-MAY-2007	27000
F114	Khaled	10-SEP-1975	CSE	Asst. Prof.	10-MAY-2004	35000
F117	Rania	15-MAY-1979	IT	Asst. Prof.	10-MAY-2005	33000

1. Display all the records from table Employee.
2. Find all the employees who are working for **CSE department**.
3. Get the details about the employees who have joined after **'10-JUN-2005'**.
4. Find all the employees who earn more than **30000**.
5. Get the details of employees who are **not 'Professor'**.
6. Find the **name, date of birth, and designation** of all the employees who work for **'IT' department**.
7. Find all the **departments which are offering salary above 25000**.
8. Find the **names and departments of employees who earn the salary in the range 20000 to 40000**.